

AMENDMENTS TO THE CLAIMS

## Listing of Claims

1. (currently amended): A document image capture and processing system comprising:

a document scanner for scanning a document and providing a digital image of information on the document to an image buffer;

a document transport for transporting paper documents past the document scanner;

a computer having a trend array for storing maximum values of scanner output as a document is scanned;

trend analyzer logic in the computer for evaluating the maximum values in the trend array to determine a rate of scanner performance deterioration;

~~maintenance projection logic in the computer responsive to the trend analyzer for projecting when maintenance will be required to retain system operating integrity; and~~  
~~monitor logic for receiving projected maintenance required for presentation to a system controller.~~

2. (originally presented): The document image capture system of claim 1 further comprising:

adjust logic in the computer for adjusting the maximum values of scanner picture element output in an initial row of the trend array after an interval to generate an adjusted maximum value for each scanner picture element;

the adjust logic in the computer, adjusting a maximum picture element value by a larger amount when the maximum value of scanner picture element output indicates a return to acceptable performance by the scanning portion of the image system and adjusting a maximum picture element value by a smaller amount when the maximum value of scanner picture element output

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indicates a deterioration of acceptable performance by the scanning portion of the image system.

3. (originally presented): The document image capture system of claim 2 further comprising:

trend array shift logic in the computer for shifting the adjusted maximum value of each scanner picture element output from the initial row of the trend array after an interval to an adjacent row in the trend array to generate a column of adjusted maximum values for each scanner picture element;

the trend analyzer logic responding to a slope of a rate of change of adjusted maximum values in a column of adjusted maximum values for a scanner picture element to generate a projection of when maintenance will be required.

4. (originally presented): The document image capture system of claim 1 further comprising:

a minimum trend array in the computer for storing minimum values of scanner output as a document is scanned;

the trend analyzer logic in the computer, evaluating the maximum values in the trend array and the minimum values in the minimum trend array to determine a rate of scanner performance deterioration.

5. (currently amended): The document image capture system of claim 1 further comprising:

image processor logic in the computer for processing information received from the image buffer;

interleave control logic in the computer for interleaving a test digital image of known information between digital images of information on documents in the image buffer;

comparator logic in the computer for comparing processed test image result information with expected result information to detect defects in image processing portions of the system;

~~the monitor logic receiving indications of defects detected by the comparator and receiving the projected maintenance required for presentation to a system controller. the rate of scanner performance deterioration are indications of the health of image processing portions and scanner devices of the system.~~

6. (currently amended): The document image capture system of claim 3 further comprising:

image analyzer logic responsive to image data in the image buffer for analyzing each image to detect defects in image capture portions of the system.

~~the monitor logic receiving indications of defects detected by the image analyzer and detected by the comparator and receiving the projected maintenance required for presentation to a system controller.~~

7. (originally presented): The document image capture system of claim 6 wherein the image analyzer logic further comprises:

a document centering detector for monitoring the document centering function of the document transport;

a document skew detector for monitoring the document aligning function of the document transport; and

a maximum video gradient detector for monitoring scanner picture element sensors and data path by detecting a maximum contrast of the digital image of information on the document in the image buffer.

8. (currently amended): Method for indicating operating integrity of a document image capture and processing system comprising steps of:

scanning a document and providing a digital image of information on the document to an image buffer;

transporting paper documents past the document scanner;

storing maximum values of scanner output in a computer trend array as a document is scanned;

evaluating the maximum values in the trend array to determine a rate of scanner performance deterioration;

~~projecting when maintenance will be required to retain system operating integrity from the rate of scanner performance deterioration; and~~

~~presenting the projected maintenance required to a system controller.~~

9. (originally presented): Method of claim 8 further comprising steps of:

adjusting the maximum values of scanner picture element output in an initial row of the trend array after an interval to generate an adjusted maximum value for each scanner picture element; and

adjusting a maximum picture element value by a larger amount when the maximum value of scanner picture element output indicates a return to acceptable performance by the scanning portion of the image system and adjusting a maximum picture element value by a smaller amount when the maximum value of

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scanner picture element output indicates a deterioration of acceptable performance by the scanning portion of the image system.

10. (originally presented): Method of claim 9 further comprising steps of:

shifting the adjusted maximum value of each scanner picture element output from the initial row of the trend array after an interval to an adjacent row in the trend array to generate a column of adjusted maximum values for each scanner picture element; and

responding to a slope of a rate of change of adjusted maximum values in a column of adjusted maximum values for a scanner picture element to generate a projection of when maintenance will be required.

11. (currently amended): Method of claim ~~1~~ 8 further comprising steps of:

storing minimum values of scanner output in the trend array as a document is scanned; and

evaluating the maximum values in the trend array and the minimum values in the minimum trend array to determine a rate of scanner performance deterioration.

12. (currently amended): Method of claim ~~1~~ 8 further comprising steps of:

interleaving a test digital image of known information between digital images of information on documents in the image buffer;

processing information received from the image buffer;

comparing processed test image result information with expected result information to detect defects in image processing portions of the system; and

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the indications of defects detected by the comparator and the rate of scanner performance deterioration are indications of the health of image processing portions and scanner devices of the system.

~~presenting to the system controller, indications of defects detected.~~

13. (currently amended): Method of claim 10 further comprising step of:

responding to image data in the image buffer by analyzing each image to detect defects in image capture portions of the system, ~~and~~

~~presenting indications of defects detected by the image analysis and detected by comparing to a system controller.~~

14. (originally presented): Method of claim 13 wherein the image analyzing step further comprises:

monitoring the document centering function of the document transport;

monitoring the document aligning function of the document transport; and

monitoring scanner picture element sensors and data path by detecting a maximum contrast of the digital image of information on the document in the image buffer.

15. (currently amended): A program on a computer usable medium for indicating operating integrity of a document image capture and processing system, the program on the computer usable medium comprising:

programmed logic means for comparing a value captured at each picture element during each scan line of an image with the value captured by the picture element during a preceding scan line to collect a maximum value captured by the picture element during scanning of the image;

programmed trend array logic means including a trend array for storing maximum values of scanner output as documents are scanned;

programmed trend analyzer logic means for evaluating the maximum values in the trend array to determine a rate of scanner performance deterioration;

~~programmed maintenance projection logic means responsive to the trend analyzer means for projecting when maintenance will be required to retain system operating integrity; and~~  
~~programmed monitor logic means for receiving projected maintenance required for presentation to a system controller.~~

16. (originally presented): The program of claim 15 further comprising:

programmed adjust logic means for adjusting the maximum values of scanner picture element output in an initial row of the trend array after an interval to generate an adjusted maximum value for each scanner picture element;

the programmed adjust logic means, adjusting a maximum picture element value by a larger amount when the maximum value of scanner picture element output indicates a return to acceptable performance by the scanning portion of the image system and adjusting a maximum picture element value by a smaller amount when the maximum value of scanner picture element output indicates a deterioration of acceptable performance by the scanning portion of the image system.

17. (originally presented): The program of claim 16 further comprising:

programmed trend array shift logic means for shifting the adjusted maximum value of each scanner picture element output from the initial row of the trend array after an interval to an adjacent row in the trend array to generate a column of adjusted maximum values for each scanner picture element;

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the programmed trend analyzer logic means responding to a slope of a rate of change of adjusted maximum values in a column of adjusted maximum values for a scanner picture element to generate a projection of when maintenance will be required.

18. (originally presented): The program of claim 15 further comprising:

the programmed trend array logic means including a minimum trend array for storing minimum values of scanner output as documents are scanned; and

the programmed trend analyzer logic means, evaluating the maximum values in the trend array and the minimum values in the minimum trend array to determine a rate of scanner performance deterioration.

19. (currently amended): The program of claim ~~1~~ 15 further comprising:

programmed image processor logic means for processing information received from the image buffer;

programmed interleave control logic means for interleaving a test digital image of known information between digital images of information on documents in the image buffer;

programmed comparator logic means for comparing processed test image result information with expected result information to detect defects in image processing portions of the system;

the indications of defects detected by the comparator and the rate of scanner performance deterioration are indications of the health of image processing portions and scanner devices of the system.

~~the programmed monitor logic means receiving indications of defects detected by the programmed comparator logic means and receiving the projected maintenance required for presentation to a system controller.~~



20. (currently amended): The program of claim 17 further comprising:

programmed image analyzer logic means responsive to image data in the image buffer for analyzing each image to detect defects in image capture portions of the system.

~~the programmed monitor logic means receiving indications of defects detected by the programmed image analyzer means and detected by the programmed comparator means and receiving the projected maintenance required for presentation to a system controller.~~

21. (currently amended): The program of claim ~~6~~ 20 wherein the programmed image analyzer logic means further comprises:

programmed document centering detector means for monitoring the document centering function of the document transport;

programmed document skew detector means for monitoring the document aligning function of the document transport; and

programmed maximum video gradient detector means for monitoring scanner picture element sensors and data path by detecting a maximum contrast of the digital image of information on the document in the image buffer.